

CITY AND GUILDS OF LONDON INSTITUTE

PAPER NUMBER 765—1—01/02	EXAMINATION RADIO AMATEURS'	Monday 1 December 1975
SERIES DECEMBER 1975	PAPER WRITTEN	6.30 to 9.30 pm 3 hours
YOU SHOULD HAVE THE FOLLOWING FOR THIS EXAMINATION one answer book 'Castle's Logs'		

This examination is divided into two parts; failure in either part will carry with it failure in the examination as a whole.

Each question in Part I carries 15 marks; each question in Part II carries 10 marks.

Answer EIGHT of the following ten questions as follows: BOTH questions in PART I and SIX questions from PART II.

PART I – Answer BOTH questions in the part. Each question in this part carries 15 marks.

- What are the requirements of the Amateur (Sound) Licence A as regards the Log to be kept by an amateur transmitting station ?
 - Show by typical examples, the entries to be made in this Log, recording communication with two different amateur stations, one using Type A1 telegraphy and one using Type A3J telephony.
- Explain carefully the effect of over-modulation on a radiotelephony emission.
 - Describe a method of monitoring an amplitude modulated radiotelephony emission for checking over-modulation.

PART II – Answer ANY SIX questions in this part. Each question in this part carries 10 marks.

- What band of frequencies can be covered by a tuned circuit consisting of a variable capacitor having a minimum value of 40 pF and a maximum value of 160 pF and an inductor of 250 microhenries ?
- With the aid of a block diagram, describe the purpose and operation of each stage of a transmitter suitable for use in the 144 to 146 MHz band with emission of Type A1 and Type A3.
- State Lenz's Law of electromagnetic induction.
 - What is meant by self-induction ?
 - Describe one application where the self-inductance of an inductor is important.
- Describe with the aid of diagrams, how electromagnetic waves are radiated from a simple aerial..
- With the aid of a circuit diagram, explain the action of a tuned radio frequency receiver (incorporating radio frequency, demodulation and audio frequency stages) for use in the amateur high frequency bands.

8. Answer EITHER (a) OR (b).
- (a) Draw a circuit diagram of a simple single stage transistor amplifier with a resistor as load, and explain the amplifying action.
- OR
- (b) Draw a circuit diagram of a resistance/capacitance coupled thermionic valve amplifier and explain the amplifying action.
9. (a) Explain what is meant by an unbalanced aerial.
- (b) With the aid of a circuit diagram, describe a suitable aerial coupling arrangement for such an aerial and explain the method of setting it up for efficient radiation.
10. (a) How can a moving-coil meter be adapted for use with alternating currents ?
- (b) Describe an instrument for voltage measurement at radio frequencies.